

REMARKS

Reconsideration of the application in light of the amendments and the following remarks is respectfully requested.

Statement of Substance of Interview

This is a statement on the substance of a telephonic interview conducted on June 22, 2010 between Melvin C. Garner (the undersigned), Mitsu Haraguchi, Supervisory Primary Examiner Christopher Tate and Examiner Aaron Kosar.

The undersigned and Mitsu Haraguchi contacted the Examiners to discuss draft claims the undersigned had provided prior to the interview. The undersigned further provided additional materials including a flow chart as an aide for discussion. After the undersigned explained the changes made to the claims and discussed the reasons the changes make the claims allowable, the Examiners considered the points, made a few suggestions, and then indicated that the changes seem to overcome the rejections. However, the changes were substantial enough that the Examiner suggested that an RCE be filed with a response to the office action. The undersigned accepted the suggestions and appreciated the Examiners for taking a call before ending the conversation.

Status of the Claims

Claims 1 and 4-10 are pending. Claim 10 is withdrawn from consideration. Claims 1 and 4-9 have been rejected. Claims 1, 5, 6 and 8 have been amended herewith. Claims 2-4 and 7 have been canceled. Claim 11 has been added. No new matter has been introduced.

Rejections under 35 U.S.C. § 112

Claims 1 and 4-9 have been rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In response to rejections directed to phrases “2A”, “2B ” as well as omission of essential steps, Applicant has amended claim 1 to comply with the requirements made by the Examiner by eliminating those phrases, while introducing letters (“a” through “e”) and more substantial process terms such as “pre-treating,” “filtrating,” “separating,” and “monosaccharification” to clearly define the invention.

In response to rejections directed to “weight-based” and “mixing ration” in claim 5, Applicant amended both claims 1 and 5 to overcome the rejections.

In response to rejections of claims 6 and 7 directed to “uses” and “using,” Applicant amended claim 6 to comply the requirements. Claim 7 has been canceled

In response to rejections directed to “the solid” in claim 6, Applicant corrected the claim to satisfy the antecedent basis.

Accordingly, the rejections under 35 USC § 112 are respectfully traversed, and reconsideration is requested.

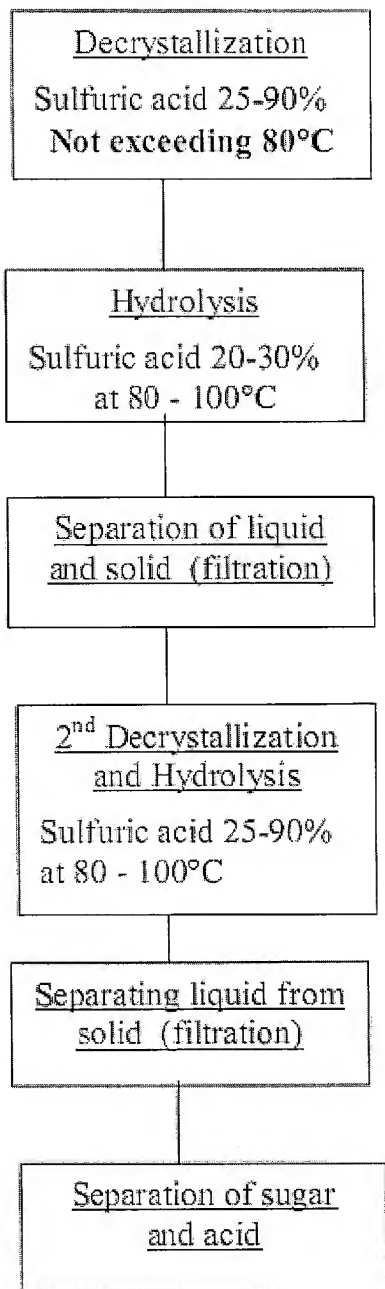
Rejections under 35 U.S.C. § 103

Claims 1 and 4-9 have been rejected under 35 USC § 103(a) as being unpatentable over Farone *et al* (US5,597,714). The Examiner alleged that Farone teaches a method of making monosaccharides from a biomass.

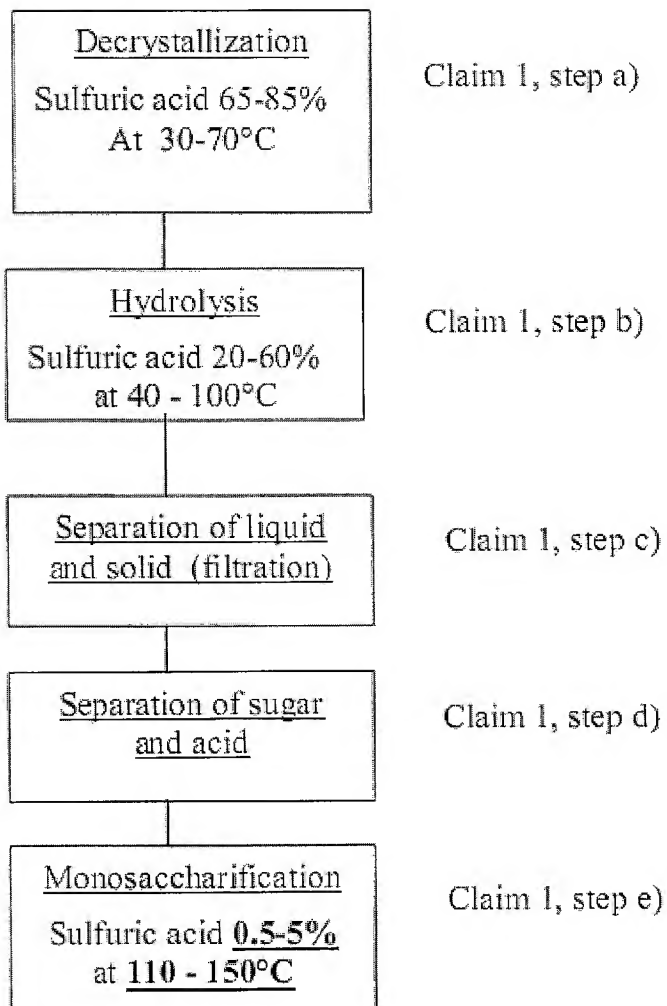
The rejection is respectfully traversed, and reconsideration is requested.

In order to show the difference between prior art and the current invention, Applicant presents a flow chart that compares the two procedures.

Prior Art (Farone)



Current Invention



As shown in the chart, the current application is characterized by producing monosaccharides using a simplified process which comprises five steps. In contrast, Farone comprises six or seven steps (if the second hydrolysis is counted as one step) to convert a biomass to monosaccharides. Although the last step of the current application, monosaccharification, is not disclosed in the prior art, the Examiner argued that a person of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention by adjusting the conditions of the second decrystallization and the second hydrolysis of Farone, e.g. acid concentrations and temperatures, to minimize the negative effects introduced by such conditions. Applicant respectfully disagrees.

First, the monosaccharification process is performed after separation of sugar and acid in order to convert a saccharification liquid (raffinate) that contains sulfuric acid, sugar and the unreacted oligosaccharides into monosaccharides. In contrast, Farone's second hydrolysis, where further saccharification takes place, is performed before separation of sugar and acid.

Secondly, the range of temperatures of the monosaccharification process of the current application, 110-150°C, is above the conditions of the second decrystallization step disclosed in the Farone prior art. In fact, Farone teaches away this condition stating that "[T]he decrystallization is performed such that the temperature does not exceed 80°C...If the temperature exceeds 80°C, much of the C5 sugars will be lost..." (Farone, column 7, line 16). Thus, one with ordinary skill in the art would not be motivated to raise the temperature beyond 100°C.

Thirdly, the range of sulfuric acid concentration used in the monosaccharification process of the current application is far lower than the one disclosed in the second decrystallization step in the Farone prior art. Although the Examiner alleged that "[o]ne would have been motivated to have provided dilute 0.5 to 5% (w/w) sulfuric acid... because Farone teaches that concentrated acid has handling difficulties and would be more costly," the range of acid concentrations mentioned in the prior art as being costly is 60 to 90%. Furthermore, the prior art also teaches away from the low concentration stating that;

The dilute acid processes generally involve the use of 0.5% to 15% sulfuric acid to hydrolyze the cellulosic material. In addition, temperatures ranging from 90 – 600 °C, and pressure up to 800 psi are necessary to effect the hydrolysis. At high temperatures, the sugars degrade to form furfural and other undesirable byproducts. The resulting glucose yields are generally low, less than 50%. Accordingly, the dilute acid processes have not been successful in obtaining sugars from cellulosic material in high yields at low cost.”(Farone, column 1, line 51, emphasis added)

Accordingly, one with ordinary skill in the art would not be motivated to lower the acid concentration below 15%. In addition, claim 1 requires a conversion rate at 60% or higher, while Farone discloses a low acid concentration process having a conversion rate of less than 50%.

Thus, Applicants respectfully request that the rejections of claim 1 and its dependent claims 5, 6, and 9 under 35 U.S.C. § 103 be withdrawn.

Request for Continued Examination

As suggested by the Examiner in the telephone interview, Applicant respectfully submits a Request for Continued Examination since substantial changes have been made in this response.

CONCLUSION

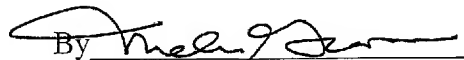
In view of the above amendments and remarks, Applicants believe the pending application and all pending claims are in condition for allowance, and earnestly solicit same.

If the Examiner feels that any remaining issues can be resolved by a Supplemental or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

The Commissioner is hereby authorized to charge any unpaid fees deemed required in connection with this submission, or to credit any overpayment, to Deposit Account No. 50-4570.

Dated: June 24, 2010

Respectfully submitted,

By 

Melvin C. Garner

Registration No.: 26,272

LEASON ELLIS LLP.

81 Main St., Suite 503

White Plains, New York 10601

(914) 288-0022

(914) 288-0023 (Fax)